



Verification of precipitation patterns over the Calabria region: poor man's ensemble versus single model deterministic forecasts

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Deterministic forecasts can be combined using multi-model methods in order to obtain some of the advantages of the probabilistic approach. Such approach is commonly called poor man's ensemble. The choice of the combination methods to be used is not so straightforward. In particular, it could affect the verification of precipitation, which is a complex activity that requires the understanding of the statistical and physical processes involved. Object-oriented methods can be used to address this complexity. The authors show the impact of several combination methods on the forecast verification of the multi-model approach. Such methods are tested over the Calabria region using about two years of precipitation forecast by three limited area models, namely, RAMS, MM5 and QBOLAM, and observed by the rain gauges available from local and national networks. The Contiguous Rain Area (CRA) analysis is the object-oriented technique used in this verification study. The CRA approach is useful to quantify the spatial errors of the predicted precipitation patterns with respect to the corresponding observation patterns. Results are compared with those from the verification of each deterministic model alone. Furthermore, the introduction of the so-called CRA Mean Shift index (CMS) summarizes the information of the spatial distribution of the location errors and allows an absolute (considering each model alone) and relative (between paired models) evaluation of the forecast performance.